

- [54] PROCESS FOR PRODUCING
GLUCOSE/FRUCTOSE SYRUPS FROM
UNREFINED STARCH HYDROLYSATES
- [75] Inventors: Louis S. Hurst; Norman E. Lloyd,
both of Clinton, Iowa
- [73] Assignee: Nabisco Brands, Inc., New York,
N.Y.
- [21] Appl. No.: 258,183
- [22] Filed: Apr. 27, 1981
- [51] Int. Cl.³ C12P 19/24
- [52] U.S. Cl. 435/94
- [58] Field of Search 435/94, 96, 99

[56] References Cited

U.S. PATENT DOCUMENTS

3,551,293	12/1970	Seidman et al.	.....	435/99
3,654,081	4/1972	Vance et al.	.....	435/99
3,663,369	5/1972	Morehouse et al.	.....	435/99
3,783,100	1/1974	Larson et al.	.....	435/95
3,853,706	12/1974	Armbruster	.....	435/99
3,909,354	9/1975	Thompson et al.	.....	435/94
3,912,590	10/1975	Slott et al.	.....	435/99
4,025,389	5/1977	Poulsen et al.	.....	435/94
4,230,802	10/1980	Ehrenthal et al.	.....	435/94
4,235,965	11/1980	Walton	.....	435/95
4,284,722	8/1981	Tamuri et al.	.....	435/94

OTHER PUBLICATIONS

- Hollo et al., Starke 27, No. 7, 232-235, (1975).
 Linko et al., Enzyme Microb. Technol., vol. 1, 1979, pp.
 273-278.
 G. B. Madsen et al., "A New, Heat Stable Bacterial

Amylase and its Use in High Temperature Liquefaction", *Die Starke*, vol. 25, No. 9, 1973, pp. 304-308.
 B. L. Scallet et al., "Studies in the Isomerization of D-Glucose", *Die Starke*, vol. 26, No. 12, 1974, pp. 405-408.
 B. J. Schnyder, "Continuous Isomerization of Glucose to Fructose on a Commercial Basis", *Die Starke*, vol. 26, No. 12, 1974, pp. 409-412.
 N. H. Aschengreen, "Production of Glucose/Fructose Syrup", *Process Biochemistry*, May 1975, pp. 17-19.
 C. Bucke, "Industrial Glucose Isomerase", In *Topics in Enzyme Fermentation and Biotechnology*, A. Wiseman, Ed., vol. 1, Chap. 7, 1976.
 N. H. Aschengreen et al., "Liquefaction, Saccharification, and Isomerization of Starches from Sources Other than Maize", *Starch*, vol. 31, No. 2, 1979, pp. 64-66.

Primary Examiner—Lionel M. Shapiro

Attorney, Agent, or Firm—Richard Kornutik; Henry S. Wyzan; Robert A. Conzett

[57] ABSTRACT

A glucose/fructose syrup is produced by enzymatically isomerizing an unrefined starch hydrolysate. The hydrolysate is prepared under controlled liquefaction and saccharification conditions to provide an isomerization substrate wherein the concentrations of calcium ions and non-enzymatically generated ketose sugars are maintained at low levels.

33 Claims, No Drawings